

Current Trends in Pertussis

by Susan Goodykoontz

Pertussis continues to be one of the most common vaccine preventable diseases reported in Arizona. The overall trend shows pertussis cases increasing with seasonal fluctuations due to outbreaks (Figure 1). Nationally, following a dramatic decrease after the introduction of diphtheria tetanus pertussis vaccine, pertussis cases have been increasing since the 1980s. The Arizona Department of Health Services is particularly concerned about the high percentage of infant cases as well as the increasing proportion of cases reported among adolescents and adults.

Surveillance has demonstrated a sustained high level of cases currently

reported in young infants, especially in the absence of any reported outbreak. Figure 2 shows the percentage of cases reported from each age group from 2000-2004. Infants are most susceptible to serious respiratory illness, complications, and even death, particularly infants less than six months who are too young to have completed the primary vaccination series^(1,4). In Arizona, three deaths have been reported in infants less than four months of age during the past three years. The high level of pertussis among infants does not appear to be attributable to suboptimal immunization rates among children. According to the July 2004 Centers for Disease Control and Prevention

(CDC) National Immunization Survey, 96 percent of Arizona's children ages 19 to 35 months received three vaccines of diphtheria tetanus acellular pertussis, which is equal to the national rate. Although Arizona continues to have pockets of underimmunized children, the majority of cases reported the past two years have been from communities with high immunization rates.

This high level of infant pertussis is a trend seen nationwide. The average annual incidence of reported pertussis cases and deaths among U.S. infants during 1980-1998 increased 50 percent. The majority of morbidity and mortality occurred among infants less than four months of age⁽⁴⁾. In 2002, the CDC initiated a multistate case-control study to characterize the contacts and exposures associated with the transmission of pertussis to U.S. infants less than four months of age. Arizona is one of four states participating in the study. Infants less than four months of age confirmed by culture, polymerase chain reaction testing, or epidemiological linkage to a laboratory-confirmed case are eligible for enrollment in the study. The original goal for study enrollment across the four states was 100 cases and 200 controls. ADHS began enrolling cases into the study in mid-2003 and to date, 43 cases and 86

Figure 1

Reported Confirmed and Probable Pertussis Cases by Age Group Arizona, 1993-2004 (as of 12/9/2004)



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controls have been enrolled. Case enrollment will cease by the end of the year.

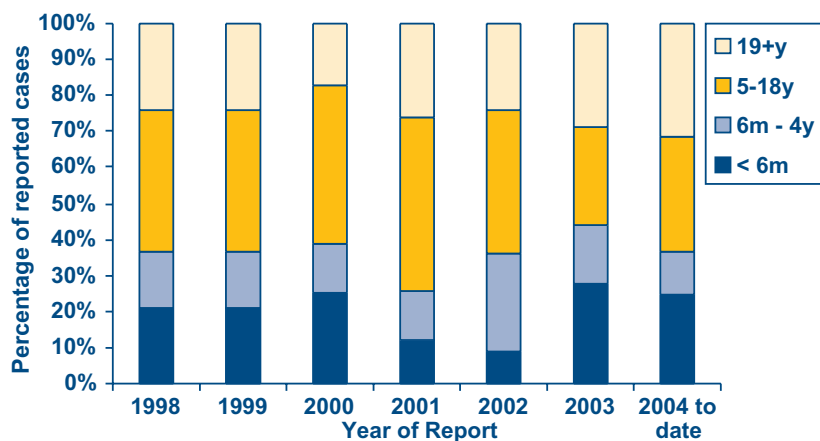
Although traditionally considered to be a childhood disease, pertussis is increasingly being recognized and reported in adolescents and adults ⁽¹⁾. This trend is reflected in the two most recent pertussis outbreaks in the state (Pima County, 2001-2002, 504 reported cases, and Yavapai County, 2002-2003, 487 reported cases), both of which began in middle schools ⁽²⁾. Waning immunity following receipt of the last dose of pertussis vaccine renders older children, adolescents and adults susceptible to pertussis. A vaccine is currently being developed in the United States for this susceptible population that combines acellular pertussis vaccine with tetanus and diphtheria toxoids (Tdap)⁽³⁾. Tdap vaccines that can be given to adolescents and adults have been licensed and are available in other counties including Australia, Canada, France and Germany.

There are several barriers to the diagnosis and surveillance of pertussis cases including the following ^(1, 3, 4, 5, 6, 7):

- Lack of availability of pertussis culture
- Challenges in culturing the fastidious *B. pertussis* organism
- Infants may show apnea only
- Vaccinated children may have a milder cough of shorter duration
- Adolescents and adults often show milder illness
- All age groups tend to experience classic symptoms at night rather than in the presence of the diagnosing provider
- Tendency of persons to delay or avoid seeking medical care for a cough illness
- Myth that pertussis is predominantly a childhood illness

Reported pertussis cases tend to represent a small proportion of true pertussis incidence ⁽²⁾. Infant cases are often more likely to be diagnosed due to increased awareness and severity of illness. High levels of infant cases are typically seen during outbreaks. Therefore, high levels of infant cases appear to be indicative of widespread community pertussis. Clinicians should consider pertussis as a possible cause of acute cough illness in adolescents and adults who have contact with infants, especially parents and siblings of infants ⁽⁴⁾. In addition, if you become aware of any potential clusters or outbreaks, especially in schools, please report these to your local health department. The Arizona State Laboratory offers pertussis culture free of charge to Arizona providers; culture kits are available by contacting your local health department.

Percentage of Reported Confirmed and Probable Pertussis Cases by Age Group, Arizona, 1998-2004 (as of 12/9/2004)



For more information on pertussis epidemiology, laboratory testing, and antibiotic treatment and prophylaxis, please refer to the CDC online manual Guidelines for the Control of Pertussis Outbreaks at the following web address: <http://www.cdc.gov/nip/publications/pertussis/guide.htm>

If you have any questions, please contact your local health department or the ADHS Infectious Disease Epidemiology Section at 602.364.3676.

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Chronic Disease Surveillance Indicators 2004

Chronic disease accounts for seven of the 10 leading causes of death in Arizona (Arizona Health Status & Vital Statistics, 2002). They are the most prevalent, costly and preventable of all health problems. Increased opportunity for primary and secondary prevention of chronic disease has resulted in the expansion of chronic disease programs within the Public Health Services of the Arizona Department of Health Services (ADHS) (Office of Chronic Disease Prevention and Nutrition Services, 2004). Health indicators address the need for a chronic disease surveillance system. Indicators were chosen if the disease, condition, or risk factor imposes a considerable public health burden and if the surveillance data are available for its inclusion into the surveillance system. These include cardiovascular disease, cancer, asthma, chronic lower respiratory disease, arthritis, blindness, diabetes, amputations, end stage renal disease (ESRD), nutrition, physical activity, overweight, obesity, tobacco, hypertension, high blood cholesterol, immunization status, and health insurance status (Chronic Disease & Epidemiology Work Group, ADHS, 2004).

The data systems used include mortality, hospital discharge, Behavioral Risk Factor Surveillance System (BRFSS), Youth Risk Behavior Surveillance System (YRBSS), United States Renal Data System (USRDS), and United States Census data.

Age-Adjusted Mortality:

Age-adjusted mortality rates are available for the following chronic diseases: cardiovascular disease, cancer, chronic lower respiratory disease, and diabetes. The principal components of cardiovascular disease are heart disease and stroke, which were the first and fourth leading causes of death in Arizona for 2002; 10,551 deaths were due to heart disease, and 2,448 deaths were due to stroke (Arizona Health Status and Vital Statistics, 2002). Cancer was the second leading cause of death in Arizona. The American Cancer Society, Inc. estimates that 1,368,030 people in the United States will be diagnosed with cancer and approximately 23,560 Arizonans will be diagnosed with cancer in 2004. Chronic Lower Respiratory Disease (CLRD), which includes chronic bronchitis and emphysema, was the third leading cause of death in Arizona for 2002. CLRD is comprised of many conditions including chronic bronchitis and emphysema. Diabetes was the eighth leading cause of death in 2002. Approximately, 262,686 Arizonans had diabetes in 2002 (Disease Estimates for 2002, ADHS, Figure 1).

Figure 2

Veronica M. Vensor

Hospital Discharge Rate per 100,000 population by Principal Diagnosis of Chronic Conditions, Arizona Residents, 2000-2002

Chronic Conditions	2000	2001	2002
Cardiovascular Disease	1674	1691	1640
Cancer	376	375	359
Asthma	100	96	114
Chronic Lower Respiratory Disease	243	220	249
Arthritis	275	275	343
Diabetes	133	144	147
Amputations	37	29	31

Hospitalizations:

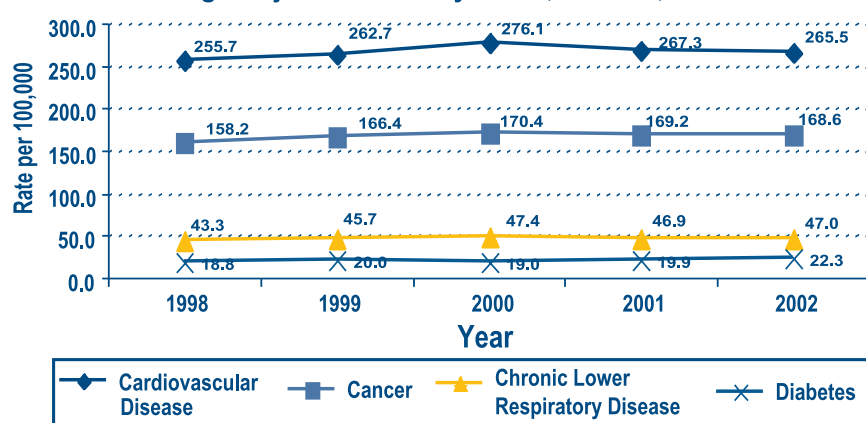
The rates of hospital discharges for chronic diseases and conditions were calculated using the state-based hospital discharge data, which contains diagnosis and treatment information for non-federal facilities (i.e. hospitalizations in federal facilities, such as the Veterans Affairs or the Indian Health Services hospitals, are excluded, Figure 2).

Prevalence:

Three methods were used to estimate the prevalence of chronic disease or conditions and risk factors. The first method was the BRFSS for the State of Arizona. The BRFSS provides prevalence estimates for asthma, arthritis, diabetes, nutrition, physical activity, overweight, obesity, smoking status, hypertension, high blood cholesterol, and immunization status. The second method utilized the National Health Interview Survey 2001. In order to calculate prevalence estimates with this method the national estimate was applied to the population denominator for the State. The final method applies only to blindness and ESRD. The National Eye Institute's 2002 Vision Problems in the USA Report was used to report on blindness. According to this report, approximately 2.75 percent of Arizonans 40 years of age and older have vision impairment or are blind. ESRD estimates were calculated using the End Stage Renal Disease Network #15 Data System. Approximately 97.7 per 100,000 population in Arizona have

Figure 1

Age-Adjusted Mortality Rates, Arizona, 1998-2002



ESRD. The following table provides the prevalence estimate for the year 2002 for chronic disease or conditions only. Prevalence estimates for risk factors are presented in the next section (Figure 3).

Figure 3

Chronic Disease or Condition	Prevalence (NHIS Estimate)	Prevalence (BRFSS Estimate)	ESRD Network #15	National Eye Institute
	Rate/100,000	Percent	Rate/100,000	Percent
Asthma	11,325.8	13.9	NA	NA
Arthritis	NA	26.6	NA	NA
Blindness	NA	NA	NA	2.75
Cancer	7,045.0	NA	NA	NA
Cardiovascular Disease	8,084.3	NA	NA	NA
Chronic Lower Respiratory Disease	NA	NA	NA	NA
End Stage Renal Disease	NA	NA	97.7	NA
Diabetes	4,799.9	6.4	NA	NA

Risk Factors:

Prevention of risk factors could prevent much of the morbidity and mortality from chronic disease. The common risk factors for the chronic diseases or conditions addressed in this report are unhealthy eating habits, physical inactivity (Figure 5), obesity, current tobacco use, hypertension, high blood cholesterol, immunization status, and health insurance status. These risk factors are as follows:

1. Unhealthy eating is eating fewer than five servings of fruits and vegetables per day. In 2002, approximately 77.3 percent of Arizona's adult population self-reported eating fewer than five servings of fruits and vegetables per day (Figure 4).
2. Overweight is a Body Mass Index (BMI) > 95th percentile for children and teens and a BMI between 25.0 and 29.9 for adults. In 2003, approximately 10.8 percent of Arizona's youth were overweight while 13.6 percent were at-risk for overweight. In 2002, approximately 36.6 percent of Arizona's adult population was overweight (Figure 6).
3. Obesity is a BMI > 30.0 for adults. In 2002, approximately 19.6 percent of Arizona's adult population was obese.
4. Tobacco use is the self-identification of current smoking status. In 2002, approximately 23.4 percent of Arizona's adult population were smokers. In 2003, approximately 20.9 percent of Arizona's youth reported smoking cigarettes on one or more days within the past 30 days compared to 7.3 percent who reported smoking cigarettes on 20 or more days within the past 30 days (Figure 7).

5. Hypertension is a diagnosis by a health care professional. In 2001, approximately 23.6 percent of Arizona's adult population were told they have hypertension by a health care provider.
6. High blood cholesterol is a diagnosis by a health care professional. In 2001, approximately 30.3 percent of Arizona's adult population were told they have high blood cholesterol levels.
7. Immunization status is a yearly flu shot or a lifetime pneumonia vaccine. In 2002, 31 percent of Arizona's adult population received a flu shot within the past 12 months and 28 percent had received a pneumonia vaccine.
8. Health insurance status is the lack of health insurance. Arizona has one of the highest rates of uninsured individuals and it is greater than the national rate (United States Census Bureau, 2003).

Data Sources:

Multiple sources contribute to data collection of surveillance of chronic disease indicators.

- BRFSS is a telephone survey conducted by the ADHS, who uses BRFSS data to track health problems and evaluate public health programs. Standard procedures

Figure 4

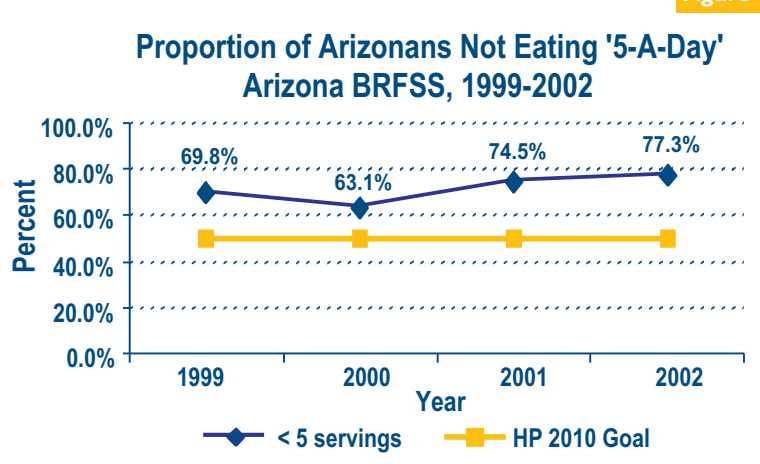
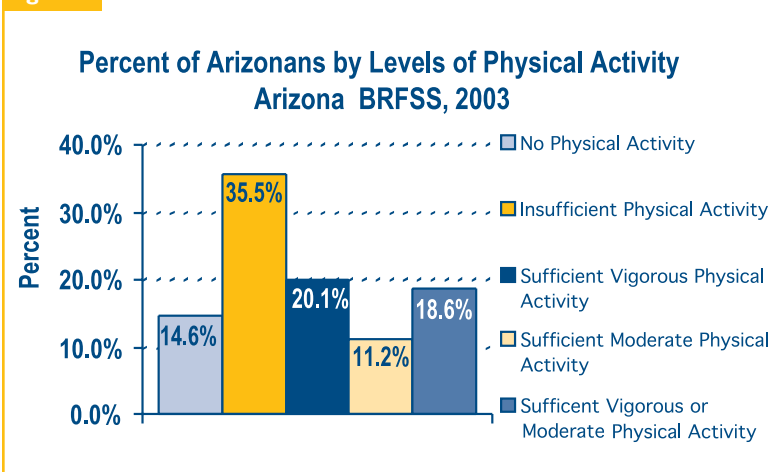


Figure 5



Chronic Disease Surveillance Indicators 2004

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through monthly telephone interviews with adults (persons aged 18 and older) are used to collect data.

- Hospital Discharge Data are records associated with a patient's stay. The data contains diagnosis and treatment information. The state-based hospital discharge data does not include federal facilities, such as the Veterans Affairs or Indian Health Service hospitals.
- Death certificates are completed for all deaths that occur in the state. The data used only reflects that of Arizona residents. Death data are used to monitor the underlying cause of death.
- The USRDS is a national data system that collects, analyzes, and distributes information on ESRD.
- The YRBSS monitors risk behaviors among youth. The risk behaviors include tobacco use,

unhealthy dietary behavior, inadequate physical activity, alcohol and other drug use, risky sexual behaviors, and behaviors that contribute to unintentional injuries and violence. The YRBSS includes local representative samples of students in Grades 9-12. The YRBSS was conducted for the first time in 2003 for Arizona.

Conclusion:

The health indicators addressed in this report were chosen if they impose a considerable public health burden and if the data were available for its inclusion. The main purpose of this report is to serve the needs of several chronic disease programs through the ongoing systematic collection, analysis and interpretation of data.

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Figure 6 Proportion of At-risk of Overweight or Overweight Children Arizona YRBSS, 2003

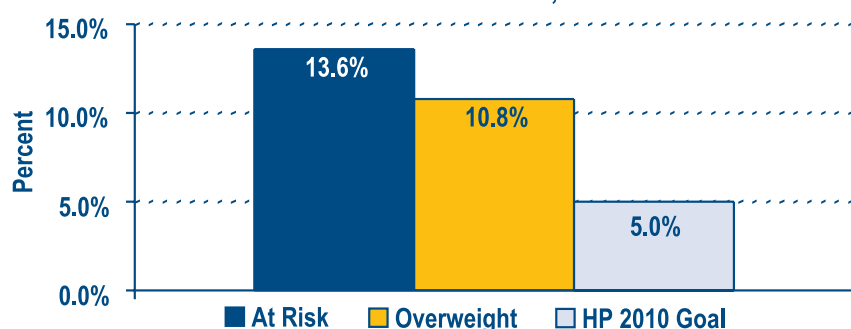
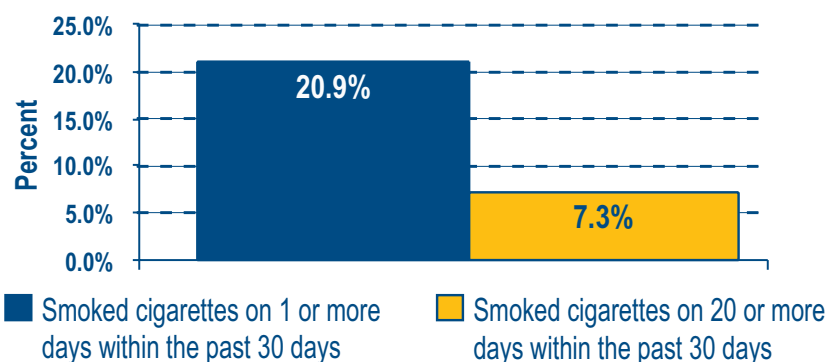


Figure 7 Proportion of Youth Smokers, Arizona YRBSS, 2003



How Can Healthcare Providers Help Protect Arizona Children?

Jan Kerrigan, RN and Polly Turpin

The Arizona Child Fatality Review Board reported last month that 48 percent of the 386 deaths of children age 1 through 17 years were preventable.

Reinforce these important messages with parents and caregivers:

- ◆ Children age 12 and under should ride in the back seat.
- ◆ Children under 40 pounds should be in a child car seat with a harness.
- ◆ Children 40-80 pounds should be in a booster seat with a shoulder/lap seatbelt.
- ◆ Babies should ride rear-facing until one year of age AND at least 20 pounds.
- ◆ Never put a rear-facing car seat in front of an airbag.
- ◆ Harness straps should be snug on child - no more than one finger should fit under strap.
- ◆ Chest clip on harness should be at armpit level.
- ◆ The car seat should be buckled so it cannot move more than one inch from side-to-side, or move forward when pulled on at the belt path.
- ◆ Four out of five car seats are used incorrectly - have them checked by a trained car seat technician.
- ◆ Ask teenagers about their seatbelt use.
- ◆ Kids riding any kind of wheels need to wear a helmet.
- ◆ Pools need a four-sided fence and self-locking gate.

If you have any questions call Arizona Safe Kids at 602.542.7340.

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February is National Children's Dental Health Month. In a society full of observational months, weeks, and days, this particular month sometimes receives little attention. Oral health is often overlooked because medical providers have so many other demands.

The American Academy of Pediatrics (AAPD) recently announced their recommendation that pediatricians perform an oral assessment for children one year of age deemed at risk. This includes anticipatory guidance and establishment of a dental home, which is defined by the American Academy of Pediatric Dentistry as, "all aspects of oral health that result from the interaction of the patient, parents, non-dental professionals, and dental professionals." This parallels earlier recommendations by the AAPD, the American Dental Association, and the Arizona Academy of Pediatric Dentists that call for the first oral examination of children to occur by one year of age. These recommendations reflect a growing acknowledgement of the need for early intervention and treatment of oral disease and the understanding that oral health is an integral part of overall health.

Dental disease is entirely preventable and has a significant impact on the health, growth and development of children. **The 2000 Surgeon General's report on oral health identified tooth decay in children as "... the single most common chronic disease ..." and "... is five times more common than asthma ...".** In fact, a survey of preschool children in Arizona reveals that 35 percent of 3-year-old children and 49 percent of 4-year-old children were found to have dental caries.

Poor oral health at an early age can have a significant economic impact during a child's later years. According to the Center for the Advancement of Health, U.S. consumers can spend up to \$60 billion on dental services each year. Also, children lose more than 51 million hours of school annually to dental-related illness, and adults miss more than 164 million hours of work a year due to oral problems and dental visits.

Preschool children are most likely to obtain cavity-causing bacteria from their mother. Dental caries are transmissible and *Streptococcus mutans* is the principal bacterium responsible for its initiation. This bacterium is not present at birth but is acquired, usually from the moth-



Dental disease is entirely preventable and has a significant impact on the health, growth and development of children.

er, but can also come from another caregiver, through intimate contact, shared utensils, licking a pacifier to "clean" it, etc. The "window of infectivity" is estimated to be between 6 and 36 months of age. A high level of bacteria in the mother's mouth increases the rate of transmission to the infant. Prolonged bottle or breastfeeding also provides an environment that enhances the development of early caries by providing a substrate favorable to the proliferation of bacteria. Children, who are infected at this early age, have a higher lifetime incidence of dental caries.

In order to prevent a lifetime of dental caries, there needs to be a coordinated effort among all health care providers – dental and medical – to perform a visual screening on all infants and toddlers, assess risk, and take appropriate action. In addition, there are efforts to train health providers on the application of topical fluoride varnish for high-risk kids during Early, Periodic, Screening, Diagnosis, and Treatment visits.

Fluoride varnish can prevent and reverse the decay process, is appropriate for high-risk infants/toddlers, is non-invasive, takes just minutes to apply, and is cost effective at less than \$2 an application.

A recent study from *Pediatrics* journal showed that it was most cost effective for a child to visit the dentist at an early age. Economic data was recorded involving children, who were continuously enrolled in Medicaid for five years, and who had their first preventative visit to the dentist at different ages. The article reported that children, who had this first visit beginning at age one year, spent \$262 on average over the five years while others who began at age four years spent \$492 on average (<http://pediatrics.aappublications.org>).

Most oral diseases and expenditures are preventable, but early health care provider action is necessary. To learn more about how to prevent dental disease in infants and toddlers, and the new professional recommendations, the entire text of *First Dental Visit by Age One: A guide to the new recommendations* can be found at www.azdhs.gov under the Office of Oral Health link.

Help reduce the impact of dental diseases in infant and toddlers - not just in February - but every day.

Tina Strickler, Program Manager, Office of Oral Health.

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SUMMARY OF SELECTED REPORTABLE DISEASES

Year to Date (January - November, 2004)^{1, 2}

	Jan - Nov 2004	Jan - Nov 2003	5 Year Median Jan - Nov
VACCINE PREVENTABLE DISEASES:			
<i>Haemophilus influenzae</i> , serotype b invasive disease (<5 years of age)	1 (0)	10 (7)	6 (4)
Measles	0	1	1
Mumps	1	0	1
Pertussis (<12 years of age)	134 (75)	119 (75)	119 (75)
Rubella (Congenital Rubella Syndrome)	0 (0)	0 (0)	0 (0)
FOODBORNE DISEASES:			
Campylobacteriosis	791	772	588
<i>E.coli</i> O157:H7	28	39	36
Listeriosis	8	12	16
Salmonellosis	711	706	713
Shigellosis	393	507	518
VIRAL HEPATITIDES:			
Hepatitis A	262	260	376
Hepatitis B: acute	276	256	195
Hepatitis B: non-acute	1,228	990	990
Hepatitis C: acute	1	7	9
Hepatitis C: non-acute (confirmed to date)	9,520 (3,266)	9,081 (3,645)	6,105 (3,645)
INVASIVE DISEASES:			
<i>Streptococcus pneumoniae</i>	577	614	708
<i>Streptococcus</i> Group A	217	224	208
<i>Streptococcus</i> Group B in infants <30 days of age	44	36	38
Methicillin-resistant <i>Staphylococcus aureus</i> ³	117	N/A	N/A
Meningococcal Infection	11	30	30
SEXUALLY TRANSMITTED DISEASES:			
Chlamydia	15,066	12,046	12,046
Gonorrhea	3,623	3,329	3,612
P/S Syphilis (Congenital Syphilis)	153 (39)	170 (16)	171 (17)
DRUG-RESISTANT BACTERIA:			
TB isolates resistant to at least INH (resistant to at least INH & Rifampin)	18 (3)	9 (1)	9 (1)
Vancomycin resistant <i>Enterococci</i> isolates	1,246	895	895
VECTOR-BORNE & ZOO NOTIC DISEASES:			
West Nile virus	387	7	N/A
Hantavirus Pulmonary Syndrome	2	0	1
Plague	0	0	0
Animals with Rabies ⁴	112	70	94
ALSO OF INTEREST IN ARIZONA:			
Coccidioidomycosis	3,514	2,321	1,794
Tuberculosis	188	199	199
HIV	512	468	468
AIDS	443	451	451

¹ Data are provisional and reflect case reports during this period.

² These counts reflect the year reported or tested and not the date infected.

³ MRSA was not reportable before October 2004.

⁴ Based on animals submitted for rabies testing.

Data compiled by Office of Infectious Disease and Office of HIV/AIDS Services



Prevention bulletin



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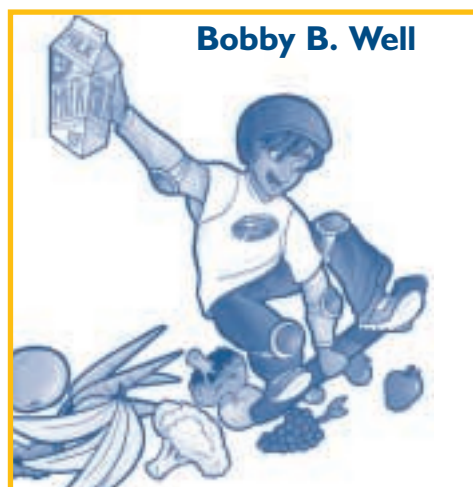
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Arizona Nutrition Network

 Sharon Sass, R.D.

The Arizona Nutrition Network provides nutrition education to Food Stamp Program participants and applicants throughout Arizona. The Arizona Department of Health Services and the Arizona Department of Economic Security works with a variety of partners in county health departments, schools, and other community settings to provide nutrition education.



Bobby B. Well

The Network links comprehensive social marketing and community education efforts to change dietary behaviors among low-income individuals in Arizona. Utilizing social marketing principles, the Network conducts three message-specific campaigns each year. The target audience is food stamp eligible women ages 18-34, and their children. The objective of the campaigns is to create awareness among the target audience that a healthier life includes:

- Eating five or more servings of fruits and vegetables each day.
- Drinking 1 percent or less fat milk.
- Being physically active, at least 60 minutes for children and 30 minutes or more for adults, on most days of the week.

The Network uses Bobby B. Well, a larger-than-life animated spokesper-

son, that is a fun, playful, and cool character that encourages the target audience to improve their health habits. Bobby appears in television ads, on billboards, in comic books, and other education materials. Creative materials for each of the three campaigns includes: 30-second television commercials in English and Spanish, wallboards in Food Stamp Offices, billboards, a web site, education materials, and a Community Tool Kit for Network partners.

This year, Network partners provided more than 500,000 direct nutrition education contacts and more than 100,000 of them participated in food demonstrations throughout the state. Look for Arizona Nutrition Network materials featuring primary prevention nutrition and physical activity messages at www.eatwellbewell.org.

Sharon Sass, R.D., Community Nutrition Team Leader, Office of Chronic Disease and Nutrition Services.